

REMARKS/ARGUMENTS

I.

Favorable reconsideration of this application, as presently amended, is respectfully requested.

Claims 45-66 are presently active in the application. Claims 1-44 have been canceled.

Applicants note with appreciation the examiner's acknowledgement of their claim for foreign priority under 35 USC 119(a)-(d) or (f) and receipt of all of the certified copies of the priority documents.

Applicants also note with appreciation the examiner's acknowledgement and consideration of their previously submitted information disclosure statement.

Claims 23-45 have been rewritten as claims 45-66 to place the claims in a format corresponding to U.S practice. The amendments do not narrow the scope of the claims. No new matter has been added.

II.

The advantages of the present invention are obtained due to the fact that before the step of pressing the stack of components of the wheel, a step of pre-pressing a blank made of one layer of abrasive material, or from abrasive material being optionally covered by a single layer of reinforcement (a layer of constituent without abrasive grains), and then a step in which the blank is integrated in the stack or in which the stack is formed on the blank. That is, the blank is composed of abrasive grain or from abrasive grains covered by layer of constituent without abrasive grains. Moreover, the advantages of the invention are obtained due to the fact the that the step of forming blank involves pouring the grains directly into the mold without first providing a layer of reinforcement in the mold.

When one wants to produce a really fine grinding wheel, generally mono-layer, particularly for performing very fine cutting, the distribution of the density of the matter composing the grinding wheel must be as perfect as possible in order to obtain the precision of rotation (without unbalance) and thus the desired precision of cutting.

The objective problem facing the prior art is thus to make it possible to decrease the thickness of the layer of abrasives without creating the problem of distribution of load in the layer, as pointed in the first paragraph on page 5 of the present specification. The solution to this problem was found by the present inventors to lie in the use of a blank constituted itself of abrasive grains.

Indeed, the present inventors discovered that, in a surprising way, the best distribution was obtained when the abrasive grains were directly poured into the mold of manufacture, without first placing a sheet in the mold. Those skilled in the art had always believed that it was essential to first put other matter in the mold before the abrasive grains to obtain a good distribution of the grains.

In the information disclosure statement submitted herewith, U.S. patent No. 2,540,112 was cited in the corresponding European examination procedure. U.S. patent No. 2,284,738 is cited at the bottom of column 2 of the '112 patent. Those references are deemed to be cumulative with respect to the references relied in the outstanding office action. For example, as noted in column 3 lines 18-23 of the '112 patent, the whole assembly is subjected to heat and sufficient pressure to compact and unite the various plies of material. Moreover, the '112 patent points out in column 4 lines 14-18 that the entire assembly is axially aligned and pressed at 4000 pounds per square inch (i.e., more than 27.5 Mpa) at a temperature of 300° F. (i.e., about 150 degrees C) for fifteen minutes. On the other hand, with the present invention, the force of pressing necessary for the final pressing stage is about 20 tons, as

explained on page 14 line 20 (i.e., a pressure of about 16 to 19 Mpa) according to the diameter (115 to 125 millimeters) and at a temperature of about 50 to 80° C.

III.

Claims 23, 24, 27, and 40-42 stand rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as obvious over either (1) Fukuda (U.S. patent No. 3,980,453), (2) Huber (U.S. patent No. 4,615,151), or (3) Padberg et al. (U.S. patent No. 5,092,082). This rejection is respectfully traversed.

Claims 23, 24, 27, and 40-42 have been rewritten as claims 45, 46, 49, and 62-64. None of the applied references teaches or suggests providing a blank as set forth in these claims. As pointed out on page 3 lines 26-28, the term “blank” is defined as a layer of constituent having a consistency such that the blank can be manipulated, and “in particular seized and moved by hand or by means of a machine.” That is, the claimed blank is a self-sustaining layer. It is not a loose association of abrasive grains as indicated in the office action. When the term “blank” is given its proper meaning as defined in the specification, it is clear that none of the applied references teaches or suggests the step recited in claim 45 of providing a blank. The applied references all relate to processes involving layers of loose abrasive grains and other constituents placed into a mold where they are heated and pressed to form the final product such as a grinding wheel. The present invention first makes the blank or blanks and subsequently uses one or more blanks along with other constituents to make a final product, such as a grinding wheel. According, claim 45 patentably distinguishes over the applied references.

Claims 46, 49, and 62-64 depend from claim 45. Therefore, those claims patentably distinguish over the applied references for the reasons stated above with respect to claim 45. Moreover, each of those claims includes additional limitations that further patentably distinguish over the applied references.

IV.

Claims 28, 29, 31, 32, 33, 38, 39, 43, and 44 stand rejected under 35 USC 103(a) as being unpatentable over or either (1) Fukuda ('453), (2) Huber, or (3) Padberg et al.

Claims 28, 29, 31, 32, 33, 38, 39, 43, and 44 have been rewritten as claims 50, 51, 52, 53, 54, 60, 61, 65, and 66.

Claim 50 depends from claim 45. Accordingly, claim 50 patentably distinguishes over the applied references for the reasons stated above with respect to claim 45. Moreover, claim 50 includes additional limitations which further patentably distinguish over the applied references. Neither Huber et al. nor Padberg et al. teaches or suggest any sort of assembly line let alone the assembly line set forth in claim 50. In Fukuda all of the layers are formed in the molding machine 3 (column 4 lines 11-24). Thereafter, the molded article is passed through a heater 8 and then sent to a rolling machine P. Accordingly, Fukuda does not teach or suggest an assembly line equipped with layer-laying stations, providing stocks of stacks at certain stations, from which stocked stacks are taken one-by-one to superpose thereon a new layer of constituent and evacuating a stack provided with a new layer from one station toward the following station. Therefore, claim 50 clearly patentably distinguishes over the applied references.

Claim 51 is directed to an installation for making grinding wheels comprising at least one machine for making blanks from abrasive grains, an assembly line equipped with stations disposed in succession for superposing at least one blank obtained from the blank-making machine an at least another constituent layer to constitute a stack of superposed layers, followed by a heating station where the stack of superposed layers is heated, and with at least one pressing machine for compressing the stack with the at least one pressing machine having a form of a pressing station positioned at one end of the assembly line or downstream from the assembly line. As pointed out above, none of the applied references teaches or suggests a

machine for making blanks from abrasive grains or an assembly line as set forth in claim 51.

Accordingly, claim 51 patentably distinguishes over the applied references.

Claims 53-55, 60 and 61 depend from claim 51. Accordingly, those claims patentably distinguish over the applied references for the reasons stated above with respect to claim 51. Moreover, each of those claims includes additional limitations which further patentably distinguish over the applied references. Moreover, the specific structure of the pressing machine set forth in claims 60 and 61 is clearly not taught or suggested by any of the applied references.

Claim 65 depends indirectly from claim 45. Therefore, claim 65 patentably distinguishes over the applied references for the reasons stated above with respect to claim 45. Moreover, none of the applied references teaches or suggests a grinding wheel having a thickness less than or equal to 2 mm, or even less than or equal to 1mm. In this respect, the invention disclosed in the present application provides the advantage that extremely thin grinding wheels may be produced.

Claim 66 is drawn to a factory or factory section for producing grinding wheels wherein the factory or factory section is divided into at least first and second zones with the first zone designed for the production of blanks constituted at least from abrasive grains and with the second zone configured for the assembly of at least one blank and at least another layer of constituent without abrasive grains in order to constitute a grinding wheel. None of the applied references teaches or suggests the claimed factory or factory section. Accordingly, claim 66 patentably distinguishes over the applied references.

V.

Claims 23, 24, 27, and 40-41 stand rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as being obvious over Shoemaker (U.S. patent No. 3,576,090).

Claims 23, 24, 27, and 40-41 have been rewritten as claims 45, 46, 49, and 60-63.

Shoemaker like the other references relied upon in the office action fails to teach or suggest providing a blank as recited in claim 45. The layer 6 disclosed by Shoemaker is a non-usable layer. That is only the layer 4 is useful for performing a grinding function (column 2 lines 70-75). Moreover, as noted above, the term “blank” as defined on page 3 lines 26-28 relates to a self-sustaining layer and not to a quantity of loose abrasive grains as indicated in the office action. Accordingly, Shoemaker fails to teach or suggest the subject matter of claim 45. Claims 46, 49, and 60-63 depend directly or indirectly from claim 45. Thus, Shoemaker also fails to teach or suggest the subject matter of those claims.

VI.

Claims 25, 26, 28, 29, 30-39, and 42-44 stand rejected under 35 USC 103(a) as being unpatentable over Shoemaker.

Claims 25, 26, 28, 29, 30-39, and 42-44 have been written as claims 47, 48, 50, 51, 52-61, and 64-66.

Claims 47, 48, and 50 depend either directly or indirectly from 45. Accordingly, those claims patentably distinguish over the applied reference for the reason stated above with respect to claim 45. Moreover, each of those claims contains additional limitations which further patentably distinguish over the applied reference. Claims 47 and 48 set forth steps involved in making the blank provided for in claim 45. The applied reference clearly

does not teach or suggest the concept of providing a blank as set forth in claim 45 let alone the steps of making such a blank as set forth in claims 47 and 48.

Claim 50 includes the additional step of arranging the layers in the form of stacks along an assembly line equipped with layer-laying stations, providing stocks of stacks at at least certain stations, from which the stocked stacks are taken one by one to superpose thereon a new layer of constituent, and evacuating the stack provided with its new layer from one station towards the following station. None of those steps is taught or suggested by Shoemaker. Accordingly, claim 50 clearly patentably distinguishes over the applied reference.

Claim 51 sets forth an installation for making grinding wheels comprising at least one machine for making blanks from abrasive grains, an assembly line equipped with stations disposed in succession for superposing at least one blank obtained from the blank-making machine and at least another constituent layer to constitute a stack of superposed layers, followed by a heating station where the stack of superposed layers is heated, and with at least one pressing machine having a form of a pressing station positioned at one of an end of the assembly line or downstream from the assembly line. The applied reference does not teach or suggest a machine for making blanks as set forth in claim 51 or the assembly line equipped with stations as set forth in claim 51. Accordingly, claim 51 patentably distinguishes over the applied reference. Claims 52-55 depend from claim 51. Accordingly, those claims patentably distinguish over the applied reference for the reason stated above with respect to claim 51. Moreover, each of those claims includes additional limitations which further patentably distinguish over the applied reference.

Likewise, claims 60 and 61 depend from claim 51. Accordingly, those claims also patentable distinguish over the applied reference for the reasons stated above with respect to claim 51. Moreover, the applied reference clearly does not teach or suggest the additional

structure of the pressing machine set forth in claims 60 and 61. Therefore, those claims clearly patentably distinguish over the applied reference.

Claim 56 sets forth an installation for production of grinding wheels comprising a station for filling a mold with at least one layer of constituent, a machine for pressing the at least one layer of constituent contained in the mold to form a blank and an assembly station designed to form a stack of superposed layers from at least one blank and at least one other layer of constituent, and a pressing machine for compressing the stack and forming a grinding wheel. The applied reference fails to teach or suggest the subject matter set forth in claim 56. The grinding wheel process described by Shoemaker all takes place in a single mold as described in column 2 lines 33-59. Accordingly, Shoemaker does not provide one station for molding and pressing an another station designed to form a stack of superposed layers from at least one blank and at least one other layer of constituent and a pressing machine for compressing that stack. Accordingly, claim 56 clearly patentably distinguishes over the applied reference.

Claims 57, 58, and 59 depend either directly or indirectly from claim 56. Therefore, those claims patentably distinguish over the applied reference for the reason stated above with respect to claim 56. Moreover, each of those claims includes additional limitations which further patentably distinguish over the applied reference. In particular, the applied reference does not teach or suggest a production carousel as set forth in claim 57 or carousel sectors as set forth in claim 58 or the specific operation as set forth in claim 59.

Claims 64 and 65 depend indirectly from claim 45. Accordingly, those claims patentably distinguish over the applied reference for the reason stated above with respect to claim 45. Moreover, each of those claims contains additional limitations which further patentably distinguish over the reference. In particular, the applied reference does not teach or suggest at least one blank sandwiched between two re-enforcing layers as set forth in claim

64 or a grinding wheel having the dimensions as set forth in claim 65. As noted above, the present invention provides for the production of extremely thin grinding wheels having a thickness less than or equal to 2 mm or even less than or equal to 1mm as set forth in claim 65. Thus, claims 64 and 65 clearly patentably distinguish over the applied reference.

Claim 66 is drawn to a factory or factory section for production of grinding wheels wherein the factory or factory section is divided into at least first and second zones with the first zone designed for the production of blanks constituted at least from abrasive grains and with the second zone configured for assembly of at least one blank and at least one other layer of constituent without abrasive grains in order to constitute a grinding wheel.

Shoemaker does not teach or suggest a factory or factory section as set for in claim 66.

Accordingly, claim 66 patentably distinguishes over the applied reference.

VII.

Claims 23, 27, 40, 41, and 43 stand rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as being obvious over White et al. (U.S. patent No. 5,637,388).

Claims 23, 27, 40, 41, and 43 have been rewritten as claims 45, 49, 62, 63, and 65.

Like the references applied in the previous rejections, White et al. fails to teach or suggest providing a blank as set forth in claim 45. As pointed out above, the term “blank” as defined on page 3 lines 26-28 relates to a self-sustaining layer and not to an association of loose grains such as the diamonds and resin blend disclosed in White et al. Accordingly, claims 45, 49, 62, 63, and 65 patentably distinguish over the applied reference.

VIII.

Claims 28, 29, 31, 32, 33, 38, 39, and 44 stand rejected under 35 USC 103(a) as being unpatentable over White et al.

Claims 28, 29, 31, 32, 33, 38, 39, and 44 have been rewritten as claims 50, 51, 53, 54, 55, 60, 61, and 66. White et al. does not disclose an assembly line as set forth in these claims. In White et al., there are only two stations. At one station a series of layers are built-up. At a second station heat and pressure are applied to the previously assembled layers. Therefore, White et al. does not disclose the process set forth in claim 50 of arranging the layers in the form of stacks along an assembly line equipped layer-laying stations, providing stacks of stacks at at least certain stations, from which the stock stacks are taken one-by-one to superpose a new layer of constituent and evacuating the stack provided with its new layer from one station toward the following station. Likewise, the installation recited in claim 51 is not taught or suggest by White et al. Claims 53, 54, and 55 depend from claim 51. Accordingly, those claims patentably distinguish over the applied reference for the reason stated above with respect to claim 51. Moreover, the additional limitations set in claims 53, 54, and 55 are not taught or suggested by the applied reference.

Claim 60 and 61 also depend from claim 51. Therefore, those claims patentably distinguish over the applied reference for the reasons stated above with respect to claim 51. In addition, the additional structure of the pressing machine set forth in claims 60 and 61 is nowhere taught or suggested in the applied reference.

Claim 66 is directed to a factory or factory section for the production of grinding wheels wherein the factory or factory section is divided into at least first and second zones with the first zone designed for the production of blanks constituted at least from abrasive grains and with the second zone configured for assembly of at least one blank and at least one other layer of constituent without abrasive grains in order to constitute a grinding wheel. The applied reference does not teach or suggest a factory or factory section comprising two zones as set for in claim 66. Moreover, the applied reference does not teach or suggest the

production of “blanks” as that term is defined in the present application at page 3 lines 26-28. Accordingly, claim 66 patentably distinguishes over the applied reference.

IX.

Claims 23, 24, 27, and 40-41 stand rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as being obvious under Fukuda (U.S. patent No. 3,950,148).

Claims 23, 24, 27, and 40-41 have been rewritten as claims 45, 46, 49, and 62-63.

Fukuda ('148) fails to teach or suggest the subject matter of these claims for the reasons stated above with respect to Fukuda ('453) discussed above. In this respect, Fukuda ('148) does not teach or suggest providing a blank as set forth in claim 45. As pointed out above, the specification on page 3 lines 26-28 defines the term “blank” such that it comprises a self-sustaining layer. On the other hand, Fukuda ('148) discloses a single mold in which layers of loose grains of abrasive and other constituents are inserted and subjected to heat and pressure. Claims 46, 49, 62, and 63 depend either directly or indirectly from claim 45. Accordingly, those claims patentably distinguish over the reference for the reason stated above with respect to claim 45. Moreover, each of those claims includes additional limitations which further patentably distinguish over the applied reference.

X.

Claims 28, 29, 31, 32, 33, 38, 39, 42, 43, and 44 stand rejected under 35 USC 103(a) as being unpatentable over Fukuda ('148).

Claims 28, 29, 31, 32, 33, 38, 39, 42, 43, and 44 have been rewritten as claims 50, 51, 53, 54, 55, 60, 61, and 64-66.

Claim 50 depends from claim 45. Accordingly, claim 50 patentably distinguishes over the applied reference for the reasons stated above with respect to claim 45. Moreover,

Fukuda ('148) does not teach or suggest the additional limitations in claim 50 that comprise the steps of arranging the layers in the form of stacks along an assembly line equipped with layer-laying stations, providing stocks of stacks at at least certain stations, from which the stocked stacks are taken one-by-one to superpose thereon a new layer of constituent, and evacuating the stack provided with its new layer from one station toward the following station.

Claim 51 is drawn to an installation comprising at least one machine for making blanks from abrasive grains and an assembly line equipped with stations disposed in succession for superposing at least one blank obtained from the blank-making machine and at least another constituent layer to constitute a stack of superposed layers, followed by a heating station and at least one pressing machine. Fukuda ('148) does not teach or suggest an installation comprising at least one machine for making blanks or an assembly line equipped with stations disposed in succession for superposing at least one blank and another constituent layer to constitute a stack of superposed layers. Accordingly, claim 51 patentably distinguishes over the applied reference. Claims 53, 54, and 55 depend from claim 51. Thus, those claims patentably distinguish over the reference for the reason stated above with respect to claim 51. Moreover, the additional limitations recited in claims 53, 54, and 55 are not taught or suggested by the applied reference.

Claims 60 and 61 also depend from claim 51. Accordingly, those claims patentably distinguish over the applied reference for the reasons stated above with respect to claim 51. Moreover, the additional limitations related to the pressing machine set forth in claims 60 and 61 are clearly not taught or suggested by the applied reference.

Claim 64 and 65 depend indirectly from claim 45. Accordingly, those claims patentably distinguish over the applied reference for the reasons stated above with respect to

claim 45. Moreover, each of those claims includes additional limitations which further patentably distinguish over the applied reference.

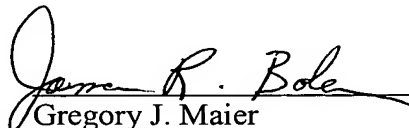
Claim 66 is directed to a factory or factory section for the production of grinding wheels wherein the factory or factory section is divided into at least first and second zones with the first zone designed for the production of blanks constituted at least from abrasive grains and with the second zone configured for the assembly of at least one blank and a least one other layer of constituent without abrasive grains in order to constitute a grinding wheel. The applied reference does not teach or suggest a factory or factory section comprising a first zone designed for the production of blanks, as that term defined in the specification of the present application, or the second zone configured for the assembly of at least one blank and at least one other layer of constituent as set forth in claim 66. Accordingly, claim 66 patentably distinguishes over the applied reference.

XI.

For the reasons stated above, Applicants respectfully request favorable reconsideration and allowance of claims 45-66.

Respectfully submitted,

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